

Vascular Access Port/VAD

Venous Access Device

- Surgically implanted device that permits repeated access to the central venous circulation.
- Generally located on anterior chest near the third or fourth rib lateral to the sternum.
- Accessed with a special needle specific to the device.
- Requires special training.

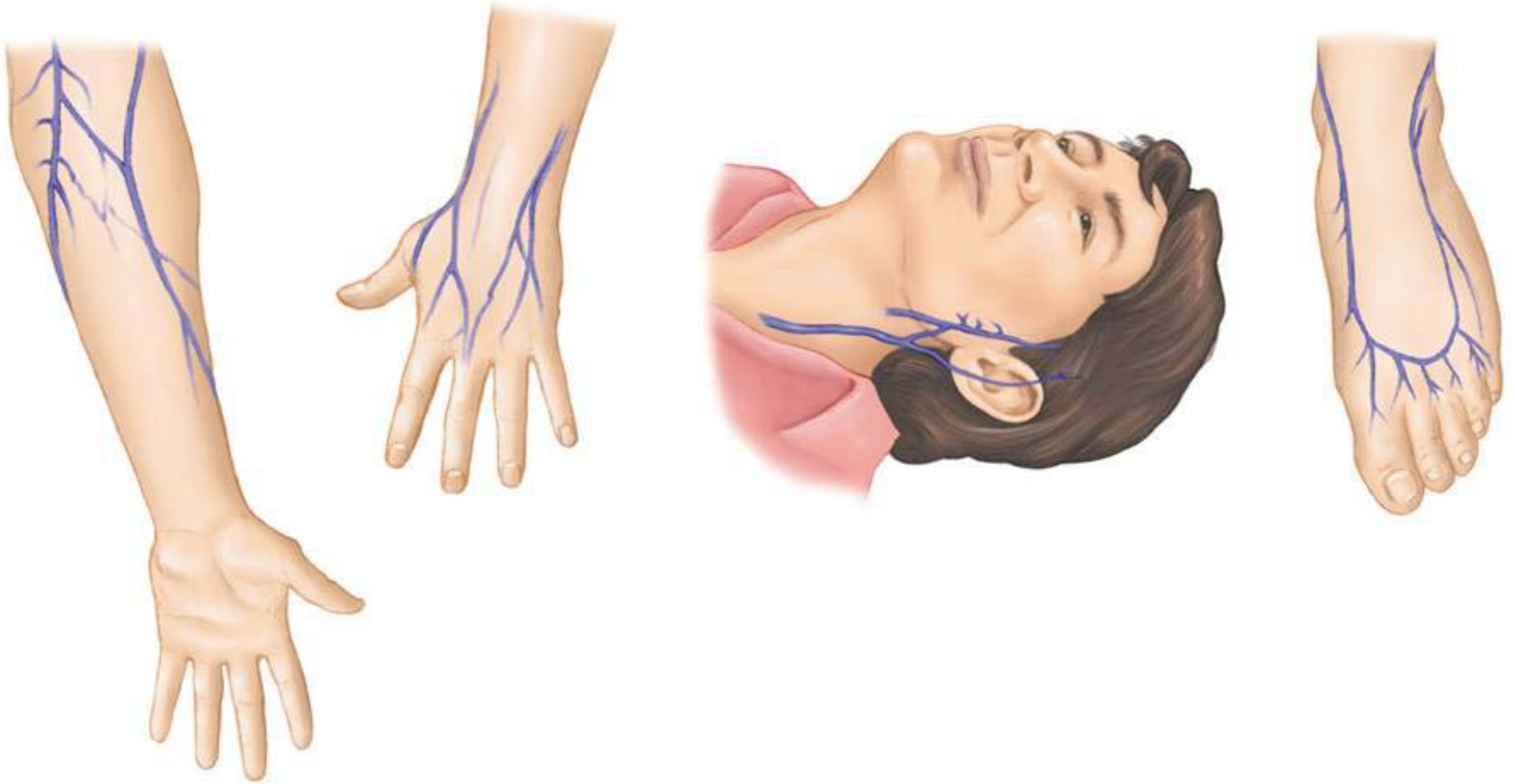
Intravenous (IV) Access Indications

- Fluid and blood replacement
- Drug administration
- Obtaining venous blood specimens for lab analysis

Types of IV Access

- Peripheral venous access
- Central venous access

Peripheral IV Access Sites



Central Venous Access

- Veins located deep in the body
- Internal jugular, subclavian, femoral
- Peripherally inserted central catheter (PICC lines)
- Larger veins that will not collapse in shock

Intravenous Fluids

Colloids

- **Colloids remain in the circulatory system for a long time.**
 - Plasma protein fraction (plasmanate)
 - Salt poor albumin
 - Dextran
 - Hetastarch (Hespan)

Crystalloids

- Primary out-of-hospital solutions
- Isotonic solutions
- Hypertonic solutions
- Hypotonic solutions

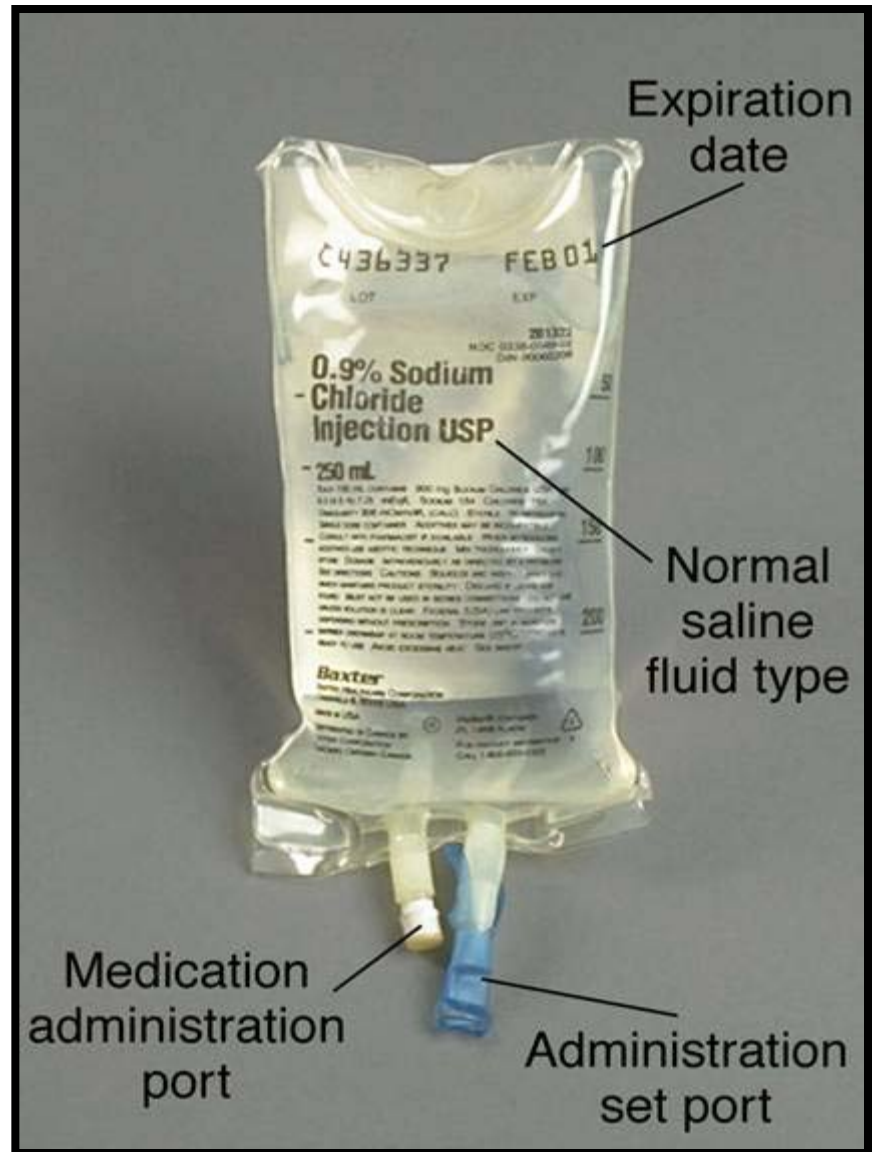
Pre-Hospital Fluids

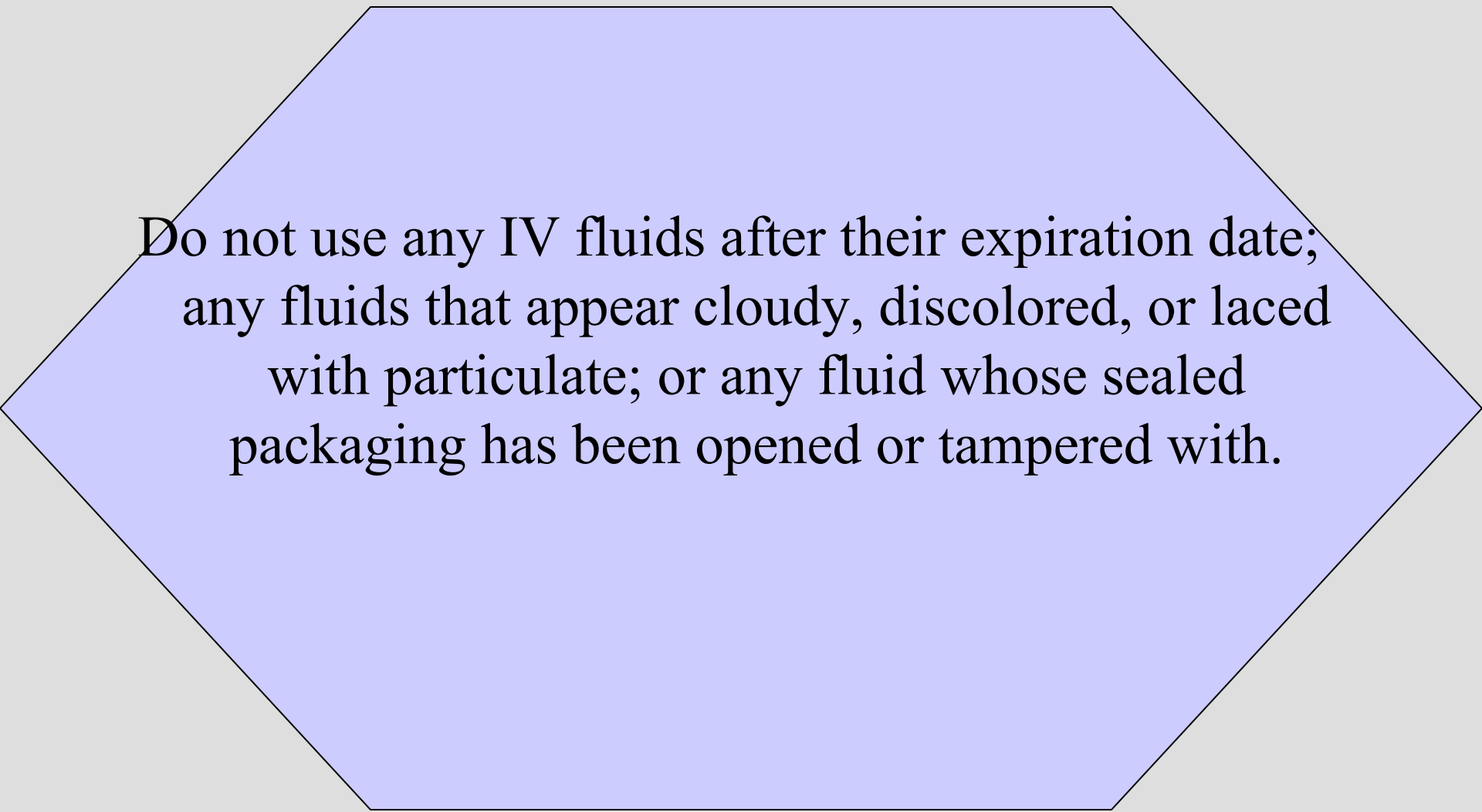
- Lactated Ringer's
- Normal saline solution
- 5% dextrose in water

Packaging of IV Fluids

- Most packaged in soft plastic or vinyl bags.
- Container provides important information:
 - Label lists fluid type and expiration date.
 - Medication administration port.
 - Administration set port.

IV Solution Containers



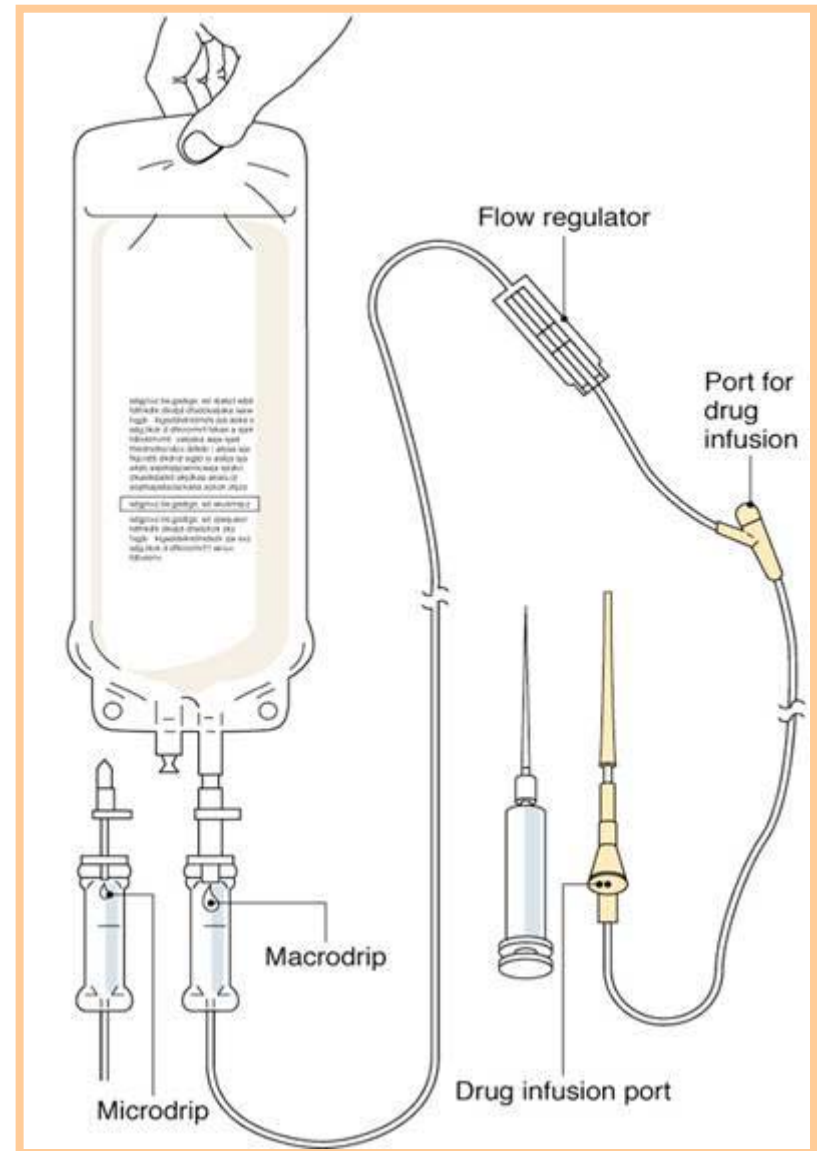


Do not use any IV fluids after their expiration date; any fluids that appear cloudy, discolored, or laced with particulate; or any fluid whose sealed packaging has been opened or tampered with.

IV Administration Sets

- Macro drip—10 gtts = 1 ml, for giving large amounts of fluid.
- Micro drip—60 gtts = 1 ml, for restricting amounts of fluid.
- IV Pump sets—15gtts = 1 ml, these sets may require an IV pump to work correctly
- Blood tubing—has a filter to prevent clots from blood products from entering the body.
- Measured volume—delivers specific volumes of fluids.

Macro drip and Micro drip Administration Sets



Secondary IV Administration Set



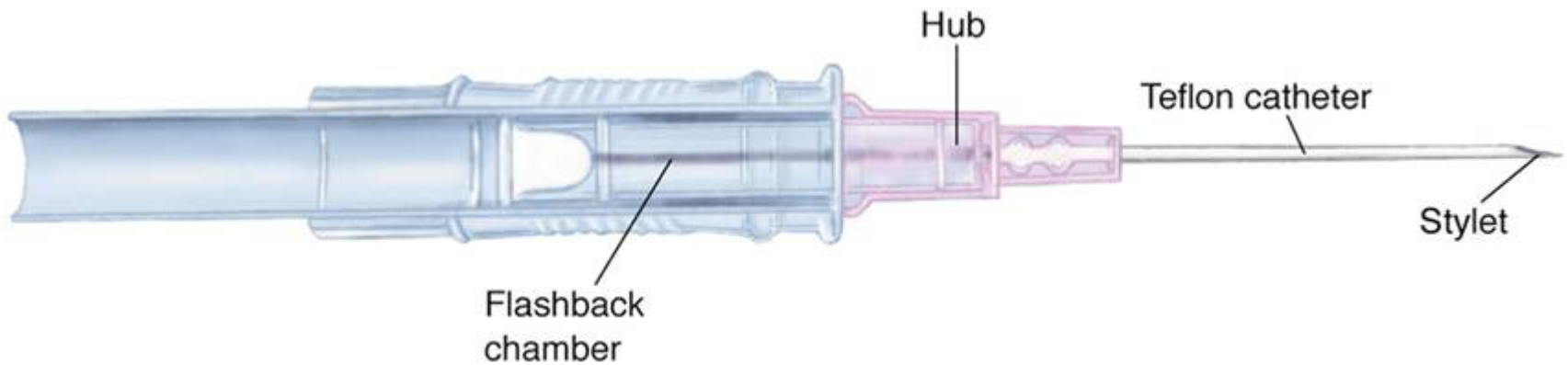
Intravenous Cannulas

- Over-the-needle catheter
- Hollow-needle catheter
- Plastic catheter inserted through a hollow needle

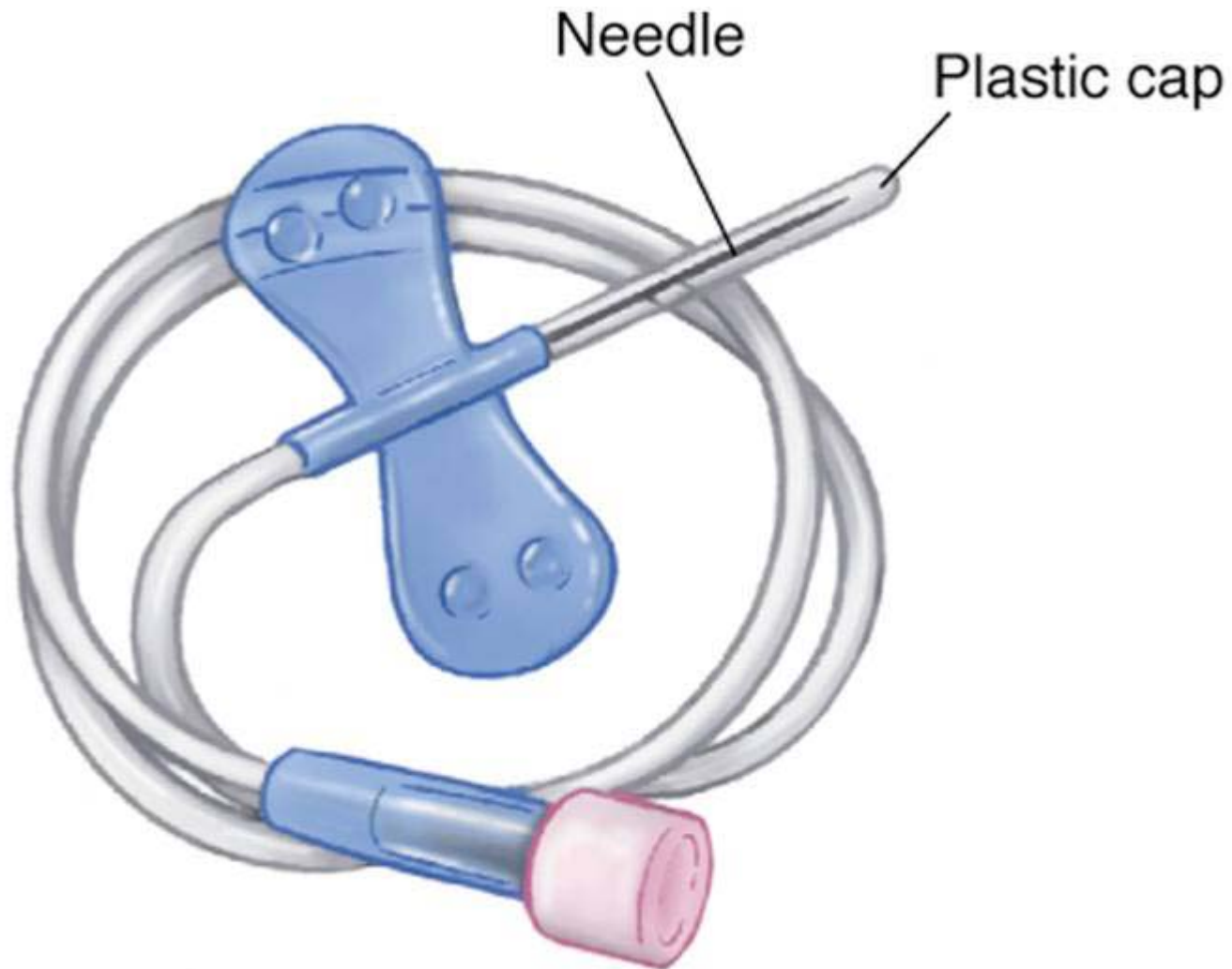
Over-the-Needle Catheter



Hollow-Needle Catheter



Catheter Inserted Through the Needle



Peripheral IV Access

Place the constricting band.



Cleanse the venipuncture site.



Insert the intravenous cannula into the vein.



Withdraw any blood samples needed.



Connect the IV tubing.



Secure the site.



Label the IV solution bag.



Peripheral Intravenous Access in an External Jugular Vein

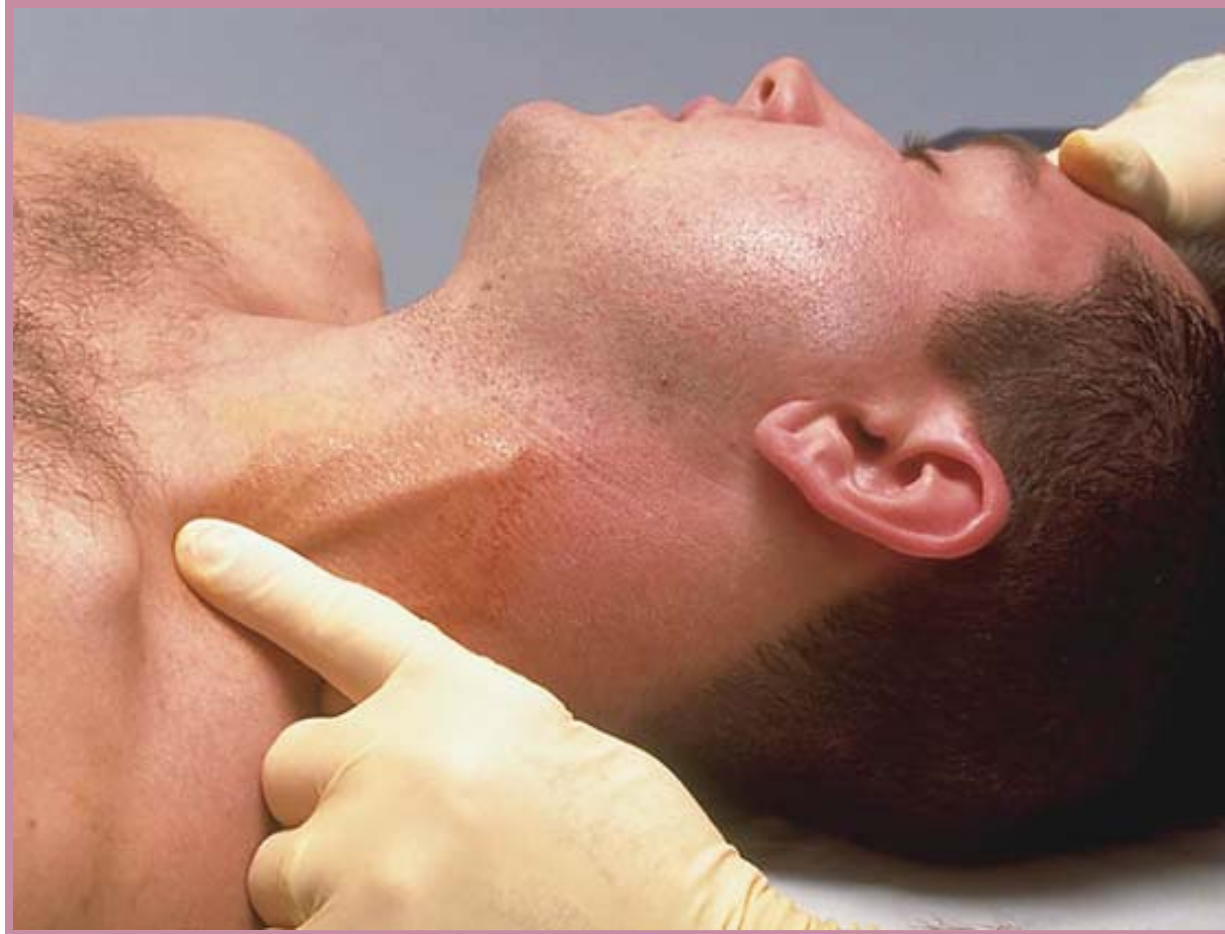
Place the patient in a supine or Trendelenburg position.



Turn the patient's head to the side opposite of access and
cleanse the site.



Occlude venous return by placing a finger on the external jugular just above the clavicle.



Point the catheter at the medial third of the clavicle and insert it, bevel up, at a 10°-30° angle.



Enter the jugular while withdrawing on the plunger of the attached syringe.



Intravenous Access With a Measured Volume Administration Set

Prepare the
tubing.



Open the uppermost clamp and fill the burette chamber with approximately 20 ml of fluid.



Close the uppermost
clamp and open the flow
regulator.



Factor Affecting IV Flow Rates

- Constricting band
- Edema at puncture site
- Cannula abutting the vein wall or valve
- Administration set control valves
- IV bag height
- Completely filled drip chamber
- Catheter patency

IV Access Complications

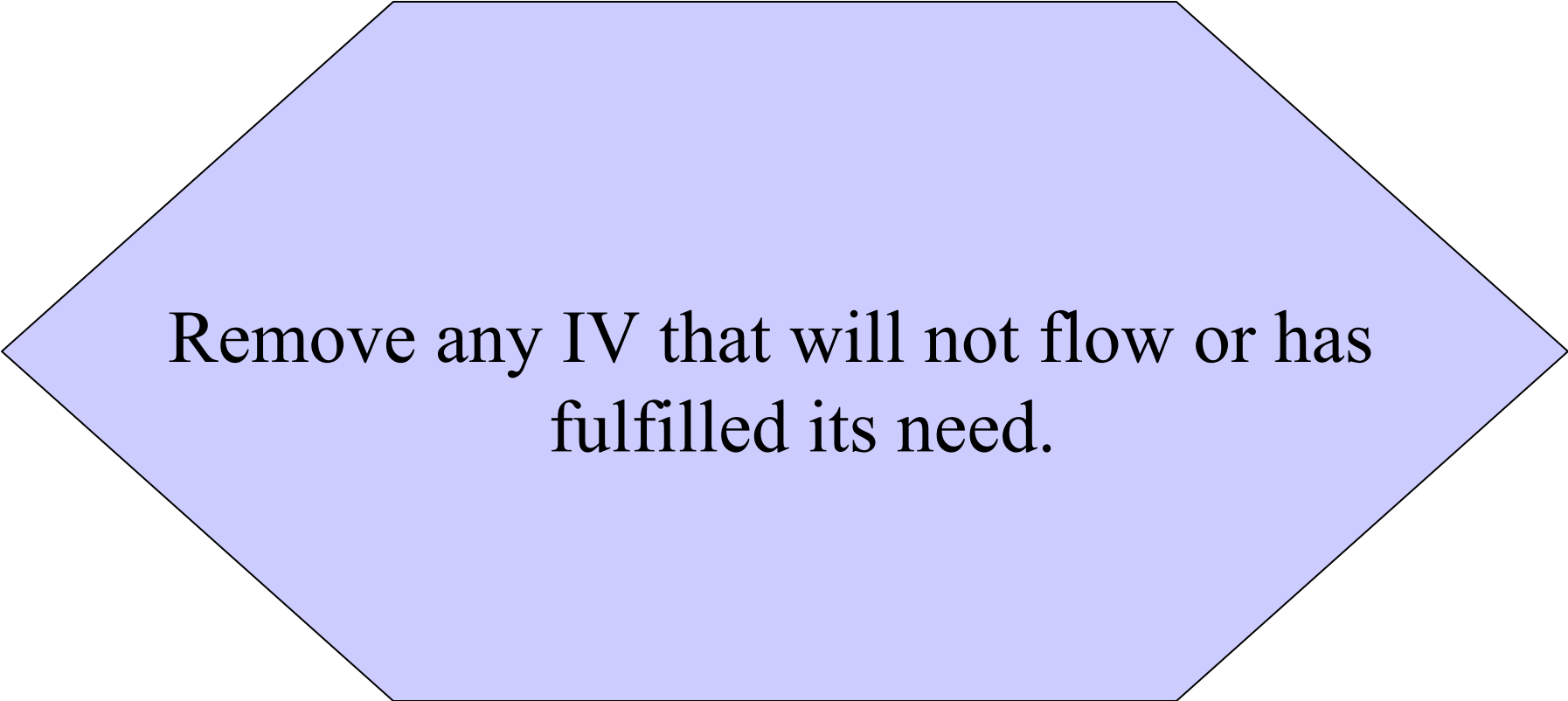
- Pain
- Local infection
- Pyrogenic reaction
- Catheter shear
- Inadvertent arterial puncture
- Circulatory overload
- Thrombophlebitis
- Thrombus formation
- Air embolism
- Necrosis
- Anticoagulants

Changing an IV Bag or Bottle

- Prepare the new bag or bottle.
- Occlude the flow from depleted bag or bottle.
- Remove spike from depleted bag or bottle.
- Insert spike into the new IV bag or bottle.
- Open the clamp to appropriate flow rate.

Heparin Lock





Remove any IV that will not flow or has fulfilled its need.

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Intraosseous Infusion Indications

- Children less than 6 years of age
- Existence of shock or cardiac arrest
- Unresponsive patient
- Unsuccessful peripheral IV

Contraindications to Intraosseous Placement

- Fracture to tibia or femur on side of access
- Osteogenesis imperfecta—
congenital bone disease resulting in fragile bones
- Osteoporosis
- Establishment of a peripheral IV line

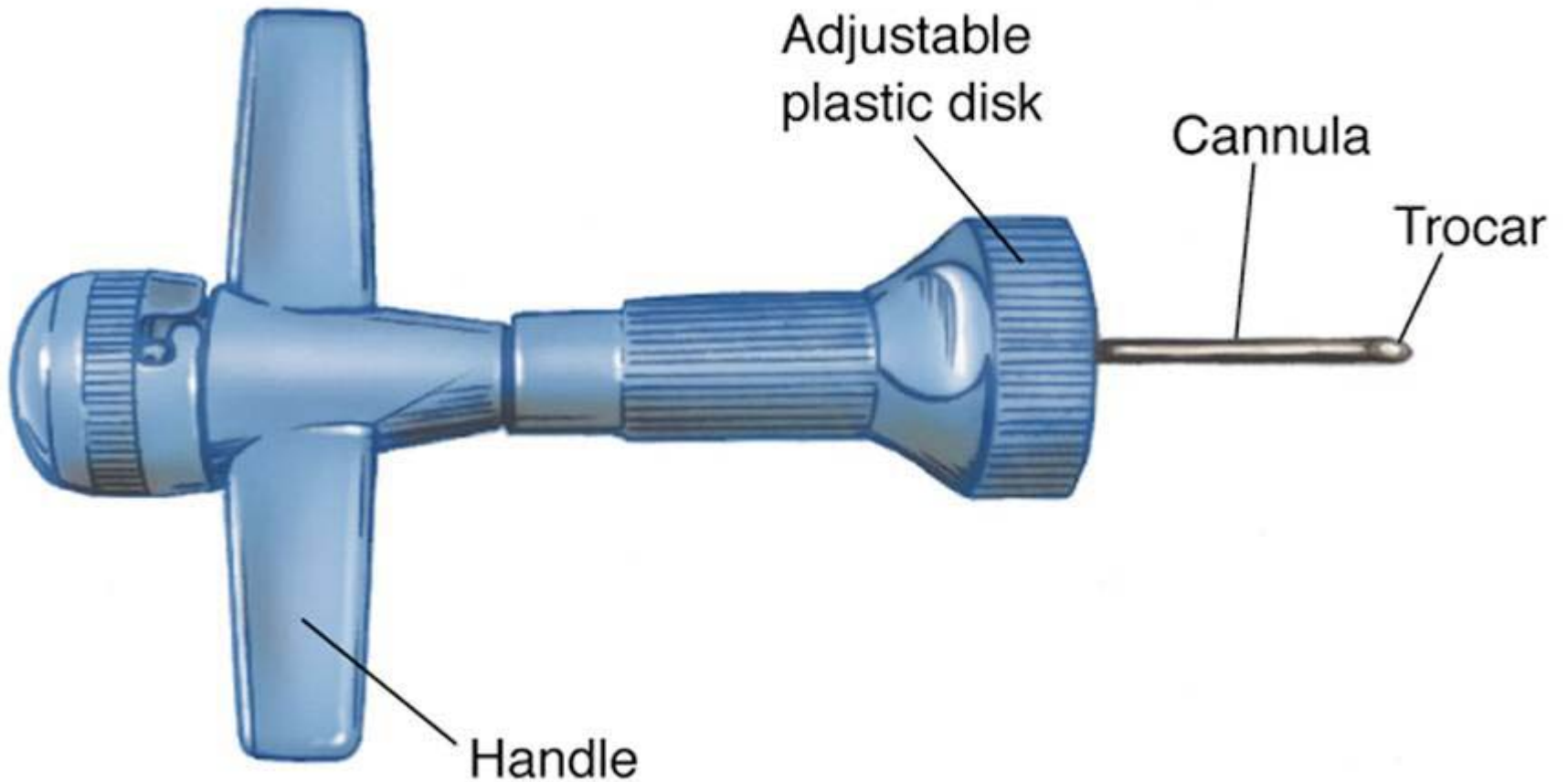
Intraosseous Infusion

- A rigid needle is inserted into the cavity of a long bone.
- Used for critical situations when a peripheral IV is unable to be obtained.
- Initiate after 90 seconds or three unsuccessful IV attempts.

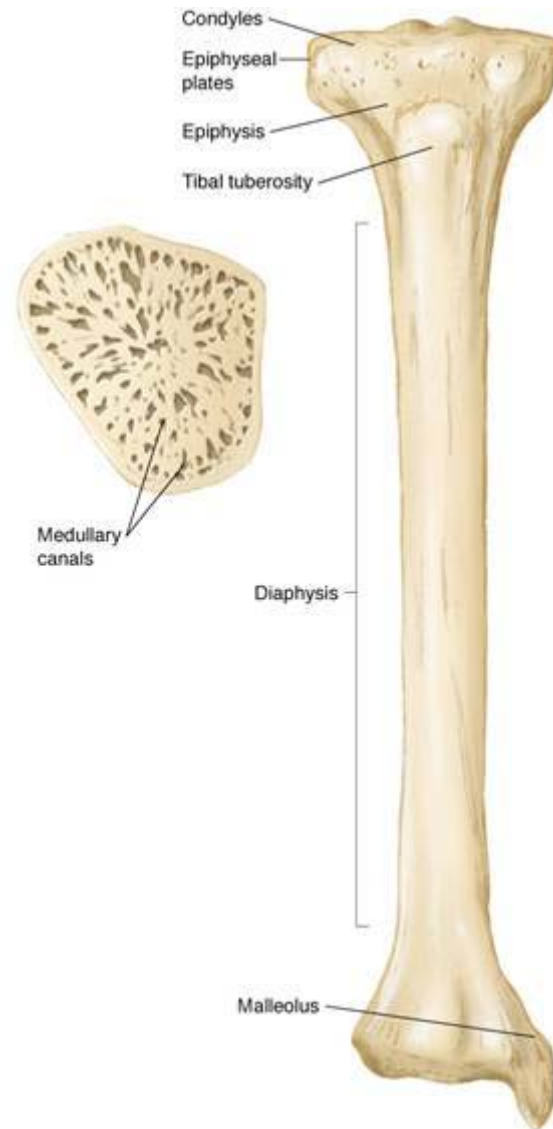
Intraosseous Access Complications

- Fracture
- Infiltration
- Growth plate damage
- Complete insertion
- Pulmonary embolism
- Infection
- Thrombophlebitis
- Air embolism
- Circulatory overload
- Allergic reaction

Intraosseous Needle



Tibia



Select the medication and prepare equipment.



Palpate the puncture site and prep with an antiseptic solution.



Make the puncture.



Aspirate to confirm proper placement.



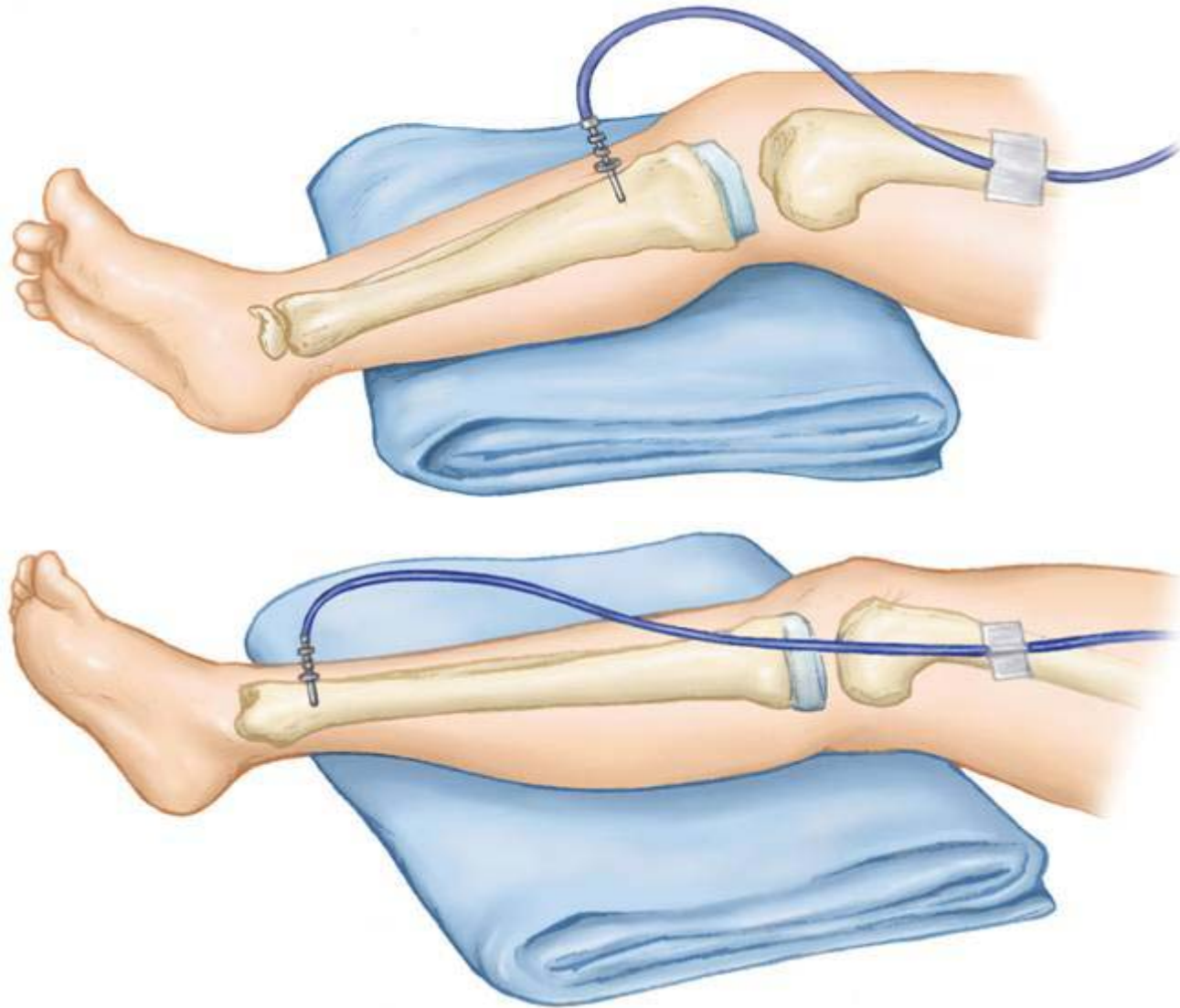
Connect the IV fluid tubing.



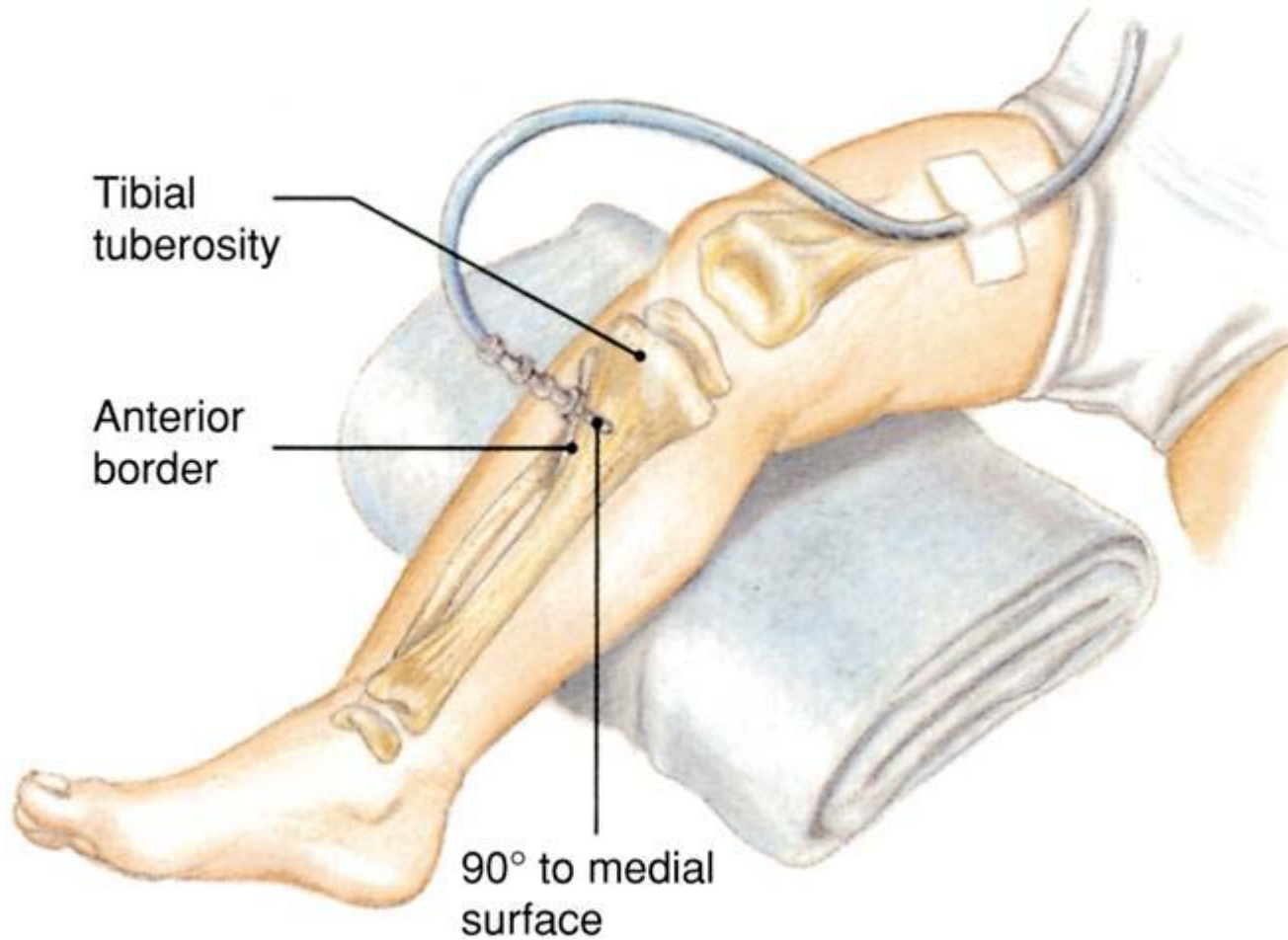
Secure the needle appropriately.



Pediatric
intraosseous
needle placement
sites.



Intraosseous administration.



Fluid Administration

**Accurate fluid dosing in
children is crucial!**